Water : Water and Ice

Objective:To explore what happens to water as it goes from solid to liquid and back again; to use observation, measurement, and communication skills to describe change.

Aim: How does water change?

Content:

In this lesson it will be addressed that water is able to take many forms but is still water. Students will understand that most substances may exist as solids, liquids, or gases depending on the temperature, pressure, and nature of that substance. This is critical to understanding that water in our world is constantly cycling as a solid, liquid, or gas.Students will observe, measure, and describe water as it changes state

Common Core Standards:

First Grade:

[CCSS.ELA-LITERACY.W.1.1](http://www.corestandards.org/ELA-Literacy/W/1/1/)

Write opinion pieces in which they introduce the topic or name the book they are writing about, state an opinion, supply a reason for the opinion, and provide some sense of closure.

[CCSS.ELA-LITERACY.W.1.7](http://www.corestandards.org/ELA-Literacy/W/1/7/)

Participate in shared research and writing projects (e.g., explore a number of "how-to" books on a given topic and use them to write a sequence of instructions).

[CCSS.ELA-LITERACY.SL.1.1](http://www.corestandards.org/ELA-Literacy/SL/1/1/)

Participate in collaborative conversations with diverse partners about grade 1 topics and texts with peers and adults in small and larger groups.

First Grade:

Science:

1.1a Animals need air, water, and food in order to live and thrive.

1.1b Plants require air,water,nutrients,and light in order to live and thrive.

Math:

First Grade

[CCSS.MATH.CONTENT.1.MD.C.4](http://www.corestandards.org/Math/Content/1/MD/C/4/)

Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.

Materials:

One per group of 3 students:

* ice
* clear plastic cups
* clear plastic container of a different shape or size
* ice cube tray
* access to a freezer
* timer
* Read Aloud:All the Water in the World by George Ella Lyon

MOTIVATION:Begin this lesson by dividing the class into pairs. Assign each student a role: writer or illustrator. Students will exchange roles during the course of the lesson.Distribute an ice cube in a clear plastic cup to each group. Have the illustrator draw a picture of what he/she sees. Have the writer write a sentence or word to describe the properties of the ice cube. Guide students' observations with questions such as the following:

* What is in the cup?
* Describe the ice. What does it look like? Feel like?
* What is the ice made of?
* How is ice made?
* Pour the ice into a container of a different shape or size. What does it look like now? Does it look the same or different? Has the shape of the ice changed? Why do you think that is?
* What will happen if we leave the ice out on the desk/table? Why? How do you know?How long might this take?

DEVELOPMENT

Tell students that they will be asked to observe the ice over time to see what changes take place. Set a timer or note 15-minute intervals on the clock. (Please note: The appropriate time interval will vary depending on the size of the ice cube, amount of sunlight, temperature in the room, etc. Choose the interval appropriate for your time constraints, number of students, age range. Although the activity could require an hour to fully complete, other activities are being conducted simultaneously.) Ask students to repeat the above recording procedures after each time interval.

Read Aloud:All the Water in the World by George Ella Lyon

When the ice has completely melted, allow students to draw their final journal entry. You can post the students’ pictures of the ice in a line on the wall, so that students will have a visual representation of the change that has occurred.
Ask students:

* What happened to the ice? Why?
* What is in the cup?
* How is it like the ice? How is it different from the ice?
* Describe the water. What does it look like? Feel like? Pour the water into a container of a different shape or size. What does it look like now? Does it look the same or different? Has the shape of the water changed? Why do you think that is?
* Did the ice change its shape when you poured it into this container? Why or why not?
* Can you think of something else that we can pour in that will take the shape of the container?
* Return the water to the glass. Is there any way that we could change this water back to ice? How? How long might this take?

Have students place one or more of the cups of water in a freezer.  If possible, repeat the procedure used above to observe change in the melting ice. Allow students to check on the water at regular intervals of your choice. When the water has frozen and the final illustration has been made, you can place a finished series of drawings up on the wall, in sequence, so that students can see the change in water temperature.
Ask students:

* Change is happening all around us. There are some changes that happen so quickly or slowly that we cannot see them. Did the change in the water happen slowly or quickly?
* How long did it take for the ice to turn into water? Do you think that there is any way to speed up this change? How? If time permits, allow students to share and test their ideas.  (Students might suggest and test blow dryer, fan, sunlight, different spots in the room, radiator, salt, stirring it, different container, etc.)
* Is there any way to slow down this change?  (different container, insulator, different location in the room, place in the shade, put a fan on it, etc.) How can we compare the rate of change? (Time it, use ice in a plastic cup as a control.)
* Can you think of anything else that changes from one form to another? In the kitchen? In the bathtub? How might soap change?

In groups or as a class, create a Venn Diagram comparing water in solid form and water in liquid form.  How are they alike?  How are they different?

ASSESSMENT

Have students answer the questions below in their journal, using words and/or pictures. Allow students to explain their answers verbally.

* How can we make water go from water to ice?
* How can we make water go from ice to water?
* Give two examples of where you would see water going back and forth from one form to another.
* Does the water ever "get tired?" Would we ever get to a point where we couldn't get this

change to happen?

Science Rubric

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| --- | --- | --- | --- | --- |
| **Statements** | **Level 1** | **Level 2** | **Level 3** | **Level 4** |
| Participates in experiments and activities | Demonstrates minimal participation; much teacher modeling and assistance needed. | Participates in experiments and activities with some teacher modeling and assistance. | Actively participates in science experiments and activities. | Participates in experiments and activities and extends the science concepts independently. |
| Shows understanding of topic. | Demonstrates a beginning understanding of topic. | Demonstrates some understanding of topic. | Shows understanding of topic. | Extends understanding of Topic’s concepts and makes connections independently. |
| Communicates ideas through writing (pictures, letters, words) | Beginning to communicate ideas using pictures. | Developing the ability to communicate ideas using pictures and letters. | Mastered the ability to communicate ideas using pictures, letters, and words. | Exceeds expectations when communicating ideas using complete sentences. |